Koch, Kristine

From: Koch, Kristine
Sent: Thursday, May 29, 2014 12:15 PM
To: 'GAINER Tom'
Cc: 'MCCLINCY Matt'; poulsen.mike@deq.state.or.us; 'PETERSON Jenn L'; 'PARRETT Kevin'; Yamamoto, Deb; Sheldrake, Sean; Allen, Elizabeth; Shephard, Burt
Subject: RE: Portland Harbor COCs and PRGs
Attachments: RE: PCB SLVs, ATLs, TRVs - and another possible RSET use for this spreadsheet?; PCB SLVs, ATLs, TRVs; RE: updated DDX SLVs; updated DDX SLVs

Tom – see responses below.

Kristine Koch
Remedial Project Manager
USEPA, Office of Environmental Cleanup

U. S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900, M/S ECL-115
Seattle, Washington 98101-3140

(206)553-6705
(206)553-0124 (fax)
1-800-424-4372 extension 6705 (M-F, 8-4 Pacific Time, only)

From: GAINER Tom [mailto:GAINER.Tom@deq.state.or.us]
Sent: Thursday, April 24, 2014 5:14 PM
To: Koch, Kristine
Cc: GAINER Tom; MCCLINCY Matt; poulsen.mike@deq.state.or.us; PETERSON Jenn L; PARRETT Kevin
Subject: RE: Portland Harbor COCs and PRGs

Kristine-
DEQ reviewed the tables provided in your 4/11/2014 email below and has the following comments. These comments are preliminary, in that DEQ needs to review the PRG write up and table footnotes on the derivation of the PRGs, which we understand will be provided in the near future.

General

1. DEQ has been operating on the model that the point-of-compliance for groundwater source control is the groundwater/surface water interface "pore water", and that in most cases upland top-of-bank monitoring wells are a workable surrogate for screening and monitoring. The PRG table differentiates PRGs for surface water (RAO 2, RAO 3, RAO 6), groundwater (RAO 4) and pore water (RAO 8). For in-water remedies and source control, is EPA implying a different points-of-compliance for some surface water PRGs other than pore water? If so, DEQ suggests that the alternative point-of-compliance be identified as necessary for individual PRGs or RAOs.

These are media of exposure and have nothing to do with points of compliance.

2. The remedial investigation of transition zone (pore water) water was limited to the projected discharge area of the main upland groundwater plumes. As such, the characterization of the nature and extent of contaminants in pore water outside of the projected discharge areas is incomplete, and the remedial investigation did not establish background values that in some cases (e.g., manganese) may reasonably be expected to exceed the risk based PRGs listed in the table. The potential for naturally occurring background concentrations of metals in pore water to exceed a risk-based PRG should be considered in the in-water FS and upland source control.

We agree that the extent of the projected discharge areas are incomplete and that background values in all media were not established. The state, who has been the lead in upland source control, has not provided EPA with any

studies they have performed to look at background values of naturally occurring contaminants, such as manganese. EPA itself has not required any studies of background either. Thus, we have no basis to conclude that any other value should be used. We are going to use the water and tissue PRGs as performance standards, not cleanup goals (PRGs).

3. RAO 8 lists the pore water PRG for the hydrocarbon range C-10 to C-12 as 2.6 ug/L. This risk-based value is quite low, and may be difficult to apply for both the upland and in-water portions of groundwater plumes.

Noted.

Ecological PRGs

4. EPA Calculated PRGs: Reasoning / justification for EPA calculation of PRGs is needed. Right now it is hard to tell why PRGs differ from the draft FS and what promulgated the change. Methodology on the calculation methodologies and assumptions should also be provided. DEQ recognizes that changes may have been made based on the final risk assessment and / or agreements between LWG and EPA regarding COCs. If this information could be referenced that would help DEQ's review. Provided are some examples of questions – this does not include a complete list. A complete review is expected on the final EPA-documented PRGs.
    a. Bird Egg: An e-mail detailing bird egg PRG calculations was provided for dioxin TEQ, however these values do not appear in the PRG table. **The email referenced was sent after the PRG table was provided to DEQ. These values have been added to the most current ECO RBT and PRG tables.** For total PCBs, new EPA PRGs are provided. Please provide the methodology for calculation. **The technology used is the same as described in the Final BERA. Attached are some emails describing the methodology.**
    b. Sediment Total PCB PRGs for the protection of fish populations based on tissue residue for the large scale sucker and the northern pike minnow appear in LWG's table, but not EPAs (152 and 85.8 ug/kg, respectively). **These have been added to the RBT table.**
    c. Belted Kingfisher, Total PCBs: This PRG is an addition to the LWG PRGs – methodology of the calculation should be provided. **See spreadsheet in attached email.**
    d. DDX: Why were the PRGs changed for clams and worms (tissue residue line of evidence)? **The PRGs are based on the final BERA whereas the draft PRGs were developed prior to drafting the BERA. Assumptions and methodologies have changed during the development of the BERA that have resulted in changes to the PRGs.** Why is the sandpiper dietary PRG of 3.18 ppm omitted and a re-calculated number not provided? **The revised value is 110 ug/kg and has been included in the table.**
        i. It is unclear why both the total DDX and the DDE PRGs are removed for Piscivorous wildlife. **The Final BERA concluded that there is not a risk to Piscivorous wildlife from DDE or DDX.** The belted kingfisher shows a risk to Sum DDE in the final risk assessment. Given this receptor is in EPA's PRG table, DEQ advocates including a Sum DDE PRG for the kingfisher. **The RBT for the kingfisher for DDX (not DDE) is 182 ug/kg. This has been added to the table.**
    e. TBT: The LWG has a PRG of 24.4 mg/kg-OC for protection of benthic community tissue residue (using worm tissue residue line of evidence). Is the 24 in EPA's table an OC normalized number (under worms, tissue residue column)? **No, the number is not an OC-normalized number.**
    f. PCB77 / PCB 126: I would recommend adding back in the PRG for these congeners, as it protects against the one case where total TEQ is exceeded because of co-located sources of PCBs and dioxins / furans (RM 7). LWG has a spotted sandpiper sediment PCB 77 PRG of 2.7 ug/kg and a mink PRG of 0.045 ug/kg / river otter 0.0680 ug/kg. I understand EPA is proposing a total TEQ approach instead. Will this be a sediment calculation of Total TEQ at each rolling river mile? **EPA is not proposing a Total TEQ approach. As provided to DEQ in the RBT and PRGs tables, there are RBTs and PRGs for total PCBs and TCDD EQ. It is EPA's position that having PRGs developed based on RBTs for these COCs is sufficiently protective and it is not necessary to develop PRGs for every PCB congener. Further, it may be that the PCBs measured at RM 7 are due to interference with other COCs such as dioxin/furans.**
    g. Benzo(a)pyrene: What about the LWG PRG of 465 mg/kg-OC for protection of bird dietary (sandpiper)? **In a meeting with DEQ and other MOU partners in March 2013, it was decided to combine all individual PAHs into Total PAHs. Risk to the sandpiper from eating a worm gave an HQ of 1.6. This is negligible risk and there are PAH risks much higher for other species that are developed for protection of all species.**

h. BEHP: How was the PRG of 400 ug/kg for sculpin and 135 ug/kg for smallmouth bass calculated? **Since a BSAF was not able to be derived from site-specific data, EPA used a national average BSAF of 4 based on the National USACE database of BSAFs.**
i. Lead: I am assuming the PRGs for lead were removed due to EPA accepting the "sinker in a fish" argument? Will this be verified with additional samples? **EPA does not have any plans to conduct additional sampling. Other species sampled in this area did not exhibit the same increased concentration of antimony and lead that was observed in this on bass sample.**
j. Aldrin: LWG PRG of 139 ug/kg? **We assume that this is for the sandpiper and have included it in the table.**

5. Spatial Scale: It appears from some of the methodology write up that PRGs were calculated using site-wide averages of fish and sediment. However, the application of the PRGs is proposed to be 0.5-1 mile segments of the river (each side independently). If compliance over smaller areas of the site is ultimately the goal, why weren't the PRGs calculated using smaller fish - sediment / tissue relationships?

RBTs were developed based on the exposure of the receptor. There were no site-wide averages of fish or sediment used in the methodology, so we are unclear why the state believes this is so. The BSAFs for the sediment/tissue relationships were developed by the LWG using the data they collected. The data does not allow for BSAFs to be developed on smaller scales because of the way that the fish were composited prior to analysis. EPA is establishing spatial scales to evaluate all species covered within the RAOs (one scale for each RAO).

6. Benthic PRGs: Clarification on the write-up for RAO 5 would be beneficial. DEQ recommends clearly separating the use of PECs as tissue residue PRGs (tissue residue of benthos, fish). An average over 0.5-mile increments is perhaps appropriate for this line of evidence since most receptors in this category move around. DEQ recommends removing the "individual" versus "population" justification for this averaging. Empirical measurements of toxicity or their predictive model counterparts are not designed to protect individual organisms and already represent population level effect levels at a given location. All samples (which represent larger areas) that pose a risk to benthic populations and community diversity should be considered along with other lines of evidence in the benthic toxicity line of evidence. It is recommended that benthic toxicity line of evidence (under "toxicity" heading) be called out separately as either measured empirical (as noted) or predicted (using PEC quotients). As discussed above, using PECs / PEC quotients for the predicted toxicity line of evidence should be point by point and mapped with other benthic toxicity lines of evidence.

PECs are sediment PRGs, not tissue-based PRGs, please clarify the second sentence of your comment. Spatial scales are not part of the PRGs. An email provided how the PRGs will be evaluated in the FS. EPA has not determined how the PRGs will be evaluated post ROD to delineate contamination or to determine remedy effectiveness. PEC/PECMQs at individual sample locations have already been plotted on maps.

7. Benthic Risk Areas ("comprehensive benthic approach"): The write up provided by Burt states:

a. Interpretation of Empirical Results: One hit rule for Hyalella survival, Chironomus biomass and survival at Level 2 and 3 effect levels and the use of the Hyalella biomass endpoint as potentially unacceptable as long as there is another line of evidence also indicating potentially unacceptable risk. Can this line of evidence come from TZW or tissue residue as well or just the other toxicity endpoints?

It can come from any other line of evidence, not just toxicity.

b. Identification of Areas Posing Potentially Unacceptable Benthic Toxicity (benthic models): DEQ would like clarification that EPA is proposing to only use PEC mean quotients to define areas posing potentially unacceptable benthic toxicity risk. The text specifically states that PECs line up better than PEL quotients. This point is debatable when comparing Map 6-11 (LRM pooled model), 6-12 (FMP individual endpoint models), 6-20 (PEC quotients), and 6-21 (PEL quotients). The PEL quotients appear to line up better with the site specific models than PEC quotients. Mean quotients of the FPM (Map 6-17) appear

to under predict toxicity by a large margin (even Level III hits are diminished), and is not an appropriate pooled model for the FPM.

While DEQ is supportive of the toxicity testing as the benchmark for unacceptable risk, there is some value in considering the areas identified by the site specific models. While DEQ does not advocate the use of FPM sediment quality values (SQVs) as PRGs, this model or the LRM may be the better at identifying these initial areas. Map 6-12 from the BERA provides a good identification of areas based on a range of multiple endpoints from level 2 and 3 exceedances. DEQ does not recommend using FPM mean quotients (shown on Map 6-17). Additionally, the LRM provides probability of toxicity based on model of all endpoints combined (pooled model) in Map 6-11.

PELs did not line up with other lines of evidence at the site. EPA is not clear what DEQ is referred to as site specific models. PECs did line up better with the toxicity lines of evidence. EPA agrees that FPM SQVs should not be used as PRGs and PRGs have not been developed based on this approach. EPA also agrees with not using FPM mean quotients and the LRM provides probability of toxicity based on model of all endpoints combined. EPA is further investigating this issue and it would be helpful if DEQ would provide a justification to support this position.

c. EPAs concurrence with other comprehensive benthic approach criteria are unclear – please clarify.
   i. TZW exceedance areas were only delineated when HQs >100 **No, EPA did not concur with this.**
   ii. Two or more adjacent sampling locations indicated potentially unacceptable risk was required for both empirical results, predictive models, and empirical or predictive bioaccumulation **No, EPA did not concur with this.**
   iii. Some lines of evidence were considered weak and not used (TBT and metals, tissue residues) **EPA is not clear what is meant here, but any COC with an HQ>1 is used.**
   iv. It must be verified that bullet #2 indicating significant toxicity as a function of biomass and growth on page 6 of Appendix P of the FS is a typo. **EPA is correcting all deficiencies in the draft FS.** DEQ notes that biomass and growth are presented in the bioassay interpretation provided in the BERA, Attachment 6. **EPA agrees.**

Human Health PRGs

8. Water PRGs, RAO 2
   a. The Lindane (gamma-BHC) AWQC in DEQ Table 40 is 0.17 ug/L for water + organism, not 1.7 ug/L.

Lindane is no longer a COC for this RAO.

   b. The only mercury AWQC in DEQ Table 40 is for methylmercury at 0.040 ug/L for organism only, not 4.3 ug/L.

This was a mistake and EPA has removed it from the table.

9. Water PRGs, RAO 3
   a) RSL values exist for four of the PBDEs:

   PBDE-47, 1.6 ug/L
   PBDE-99, 1.6 ug/L
   PBDE-153, 3.1 ug/L
   PBDE-209, 96 ug/L

   The values for specific congeners could be included in the table, or perhaps the lowest value could be used for PBDEs in general.

PBDEs have been eliminated as a COC for RAO 3 because there are no known sources of PBDEs within the site. If DEQ has information that suggests that there are sources of PBDEs within the site, EPA will add this contaminant back as a COC.

b) For PCBs, the MCL for low risk Aroclors of 0.5 ug/L is used. The RSL value for high risk Aroclors is 0.034 ug/L. **Per IRIS, low risk is appropriate when you are investigating ingestion of water soluble congeners based on the exposure scenario for drinking water.**
c) I could not confirm the DDT MCL of 39 ug/L. The RSL value is 0.2 ug/L. **EPA agrees and has made this change.**
d) The zinc RSL value of 4,700 ug/L is included for groundwater, but not surface water. **Zinc is not a COC for RAO 3.**
e) The RSL values for m-xylene and p-xylene are 190 ug/L. This could reasonably be included as the PRG for m- and p-xylene rather than having no value. **EPA concurs.**

10. Background Concentrations The background tables for human health and ecological are not identical. This may be because there are different sets of chemicals of concern. However, the human health table still contains chemicals that are not COCs for human health, such as LPAH, HPAH, TBT, and benthic toxicity.

Noted. These were working drafts. The FS will only have one table with background values that is comprehensive of all COCs.

11. Organic Carbon Correction DEQ understands that the OC correction factor was developed by taking the ratio of mean organic carbon in the study area (1.71%) to mean organic carbon in the upriver area (1.11%). This approach was presented by the LWG in Appendix A of the March 2012 draft FS report, and may lead to inappropriate conclusions. The preferred options are to use dry weight concentrations or to use organic carbon normalized concentrations. The statistics such as 95UCL and 95UPL should then be developed for both the downstream site and the upstream background data. Appendix A of the draft FS used all three approaches (dry weight, OC-corrected, OC-normalized) to develop background concentrations, although EPA has since used a different data set for background. If EPA retains the OC correction factor, DEQ suggests that text state that this simplifying approach was used and why.

Since the background data set was developed on a dry-weight basis and acknowledges that there are higher OC concentrations in the site that upriver, EPA believes that it is a reasonable and a technically valid approach to OC correct (or adjust the dry-weight values) the background data set so that is can be compared to the site data. Further, this approach is consistent with what is used in the FWM.

Because organic carbon normalization is not appropriate for inorganic compounds, if EPA includes OC-correction for organic compounds, OC-corrected values for inorganics should be omitted from the table. **EPA did not OC-correct the inorganic compounds (refer to EPA revisions to Section 7 of the RI).**

12. cPAHs Converting a PRG for carbon normalized concentrations to a PRG for dry weight concentrations makes the implicit assumption that the carbon normalized exposure point concentration is equal to the dry weight EPC divided by the mean fraction organic carbon for the site (0.0171). Dividing dry weight concentration by fraction organic carbon is the definition of organic carbon normalization for individual samples, but there is no reason to think the relationship is valid using means or 95UCLs as the EPC. DEQ believes that the following approaches for a cPAH PRG may be more appropriate. Develop a PRG using the LWG's regression equation without adjustment to dry weight, and make the site comparison with the PRG using a site EPC based on organic carbon normalized data. Another alternative is to use a regression equation developed using dry weight concentrations.

The PRG is not a mean or UCL, it is merely the result of solving the regression equation developed by the LWG as the relationship between cPAHs in clam tissue and sediment. Since the regression equation is based on OC-normalized sediment data and lipid-normalized tissue data, corrections were appropriate to derive a dry-weight sediment concentration for the PRG.

Please contact me if you have questions.

Thanks-
Tom Gainer

From: Koch, Kristine [mailto:Koch.Kristine@epa.gov]
Sent: Friday, April 11, 2014 7:38 PM
To: LIVERMAN Alex; Allen, Elizabeth; Audie Huber (audiehuber@ctuir.com); Bob Dexter; brandy.humphreys@grandronde.org; Brian Cunninghame (cunninghame@gorge.net); callie@ridolfi.com; Conley, Alanna; Erin Madden (erin.madden@gmail.com); Fuentes, Rene; Gail Fricano (gfricano@indecon.com); Genevieve Angle (Genevieve.Angle@noaa.gov); Humphrey, Chip; JD Williams (jd@williamsjohnsonlaw.com); PETERSON Jenn L; Jeremy_Buck@fws.gov; Julie Weis (jweis@hk-law.com); Matt Johnson (matt@williamsjohnsonlaw.com); MCCLINCY Matt; Michael.karnosh@grandronde.org; POULSEN Mike; Muza, Richard; rdelvecchio@indecon.com DelVecchio; Robert.Neely@noaa.gov; rose@yakamafish-nsn.gov; Sheldrake, Sean; Shephard, Burt; Susan J. Penoyar (PenoyarSJ@cdm.com); Todd King (KingTW@cdmsmith.com); tomd@ctsi.nsn.us; GAINER Tom
Subject: FW: Portland Harbor COCs and PRGs

All – I have updated the COC and PRG tables based on several comments I have received from you and the LWG. Please look over the tables and let me know if you have any comments or questions by April 25, 2014. We can discuss this at the next FS Team meeting next Wednesday, too.

Have a great weekend,
Kristine

Kristine Koch
Remedial Project Manager
USEPA, Office of Environmental Cleanup

U. S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900, M/S ECL-115
Seattle, Washington 98101-3140

(206)553-6705
(206)553-0124 (fax)
1-800-424-4372 extension 6705 (M-F, 8-4 Pacific Time, only)

From: Koch, Kristine
Sent: Friday, April 11, 2014 7:36 PM
To: Bob Wyatt (rjw@nwnatural.com); Jim McKenna (jim.mckenna@verdantllc.com)
Cc: 'Jennifer Woronets'
Subject: Portland Harbor COCs and PRGs

Bob and Jim – here are the updates to the COC and PRG tables. We have incorporated all information provided by the LWG. If you have any outstanding issues or identify any errors, please provide them to me by April 25, 2014.

1. We have moved the water PRGs for PCBs and DDX from RAO 6 to RAO 7 and have included the Alternative TRVs from the BERA for RAO 7 for these two contaminants.
2. Manganese was identified in the BERA as ES in TZW, so the COC list will remain unchanged.
3. Hexachlorobenzene for sediment in RAO 2 was calculated as follows:
   The general PRG equation for chemicals where BSAFs were developed is $C_{sed}=((C_{tiss}/f_{lipid}) \times f_{oc})/BSAF$
   LWG developed BSAFs for crappie, bullhead, and carp. None for bass, so we left those out. The lipid data for all results was provided by Burt from the BERA; Elizabeth took the simple mean of the data (bullhead = 2.4%, carp = 8.8%, crappie = 5.2%). Target concentration is 0.63 µg/kg. That calculates three different sediment concentrations, assuming equal proportions of those three fish in the diet. The final value is the reciprocal of the sum of the reciprocals, which is 0.04 µg/kg.
4. Carcinogenic PAHs PRG for sediment in RAO 2 was calculated using clams as described in the attached document.
5. EPA has re-evaluated PECs and PELs for the CBRA. In doing so, it was determined that PELs do not line up well with benthic toxicity. As such, the RBT for Benthic are only using PECs.

6. Dioxin/furan RBT was not developed for bird egg exposure.

Regards,

Kristine Koch
Remedial Project Manager
USEPA, Office of Environmental Cleanup

U. S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900, M/S ECL-115
Seattle, Washington 98101-3140

(206)553-6705
(206)553-0124 (fax)
1-800-424-4372 extension 6705 (M-F, 8-4 Pacific Time, only)